

REMARKS

Claims 1-59 remain pending in the present application.

Claims 1-59 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Shue et al. (U.S. Patent No. 6,380,056) (hereinafter "Shue") in view of Ma (U.S. Patent No. 6,207,589) (hereinafter "Ma").

The Office Action contends that "Shur [sic: Shue] clearly teaches forming an oxidation layer over a dielectric layer . . . " (Office Action dated July 29, 2003, third full para.), and cites paragraph 7, lines 33+ and claims 11-14 in Shue as support for this allegation. These cited passages, however, merely discuss what oxidizing components may be present in the annealing atmosphere 20 (Fig. 2). This discussion does not address the resulting structure formed by the annealing process.

Rather, the structure in Shue formed as a result of the annealing process is found in paragraph 7, lines 26-32. Specifically, upon annealing the partially consumed silicon layer 12', and the silicon nitride containing layer 14 in an oxidizing atmosphere, the layers 12' and 14 are transformed into a further consumed silicon layer 12'' and a thermally oxidized silicon nitride containing layer 18, respectively. This transformation is illustrated in Figs. 2-3, in which the silicon nitride containing layer 14 shown in Fig. 2 is no longer present in Fig. 3, but is replaced with oxidized layer 18 in Fig. 3. Similarly, the partially consumed silicon layer 12' shown in Fig. 2 is no longer present in Fig. 3, but is replaced with oxidized layer 12'' in Fig. 3. Thus, after exposure of the structure shown in Fig. 2 to the oxidizing atmosphere 20, silicon nitride layer 14 ceases to exist, having been replaced with thermally oxidized silicon nitride containing layer 18.

As demonstrated above, since Shue teaches that the silicon nitride (dielectric) layer 14 is entirely transformed into oxidized layer 18 (thereby exchanging one layer for

another layer), Shue's disclosed method does not form an oxidation layer over the dielectric or silicon nitride layer (forming a two-layered structure from a single layer), as claimed in the present application.

Furthermore, Shue also fails to teach or suggest the use of hydrogen gas, much less in combination with oxygen and nitrous oxide gases for forming an oxidation layer over a dielectric layer, as recited in Applicants' claims. The only mention of any materials relating to or containing hydrogen in Shue is a teaching that hydrogen containing reducing materials are specifically excluded from the annealing process used to form the silicon nitride layer. This is a significant departure from any disclosure of hydrogen gas used in combination with oxygen and nitrous oxide gases to form an oxidation layer on a dielectric layer, as claimed in the present application.

As discussed in Applicants' Response to Office Action filed on May 12, 2003, combining the disclosure of Ma with that of Shue is insufficient to overcome the deficiencies of Shue to render obvious the claimed invention. Ma, like Shue, simply does not teach or suggest forming an oxidation layer over a dielectric or silicon nitride layer, or doing so by contacting the dielectric or silicon nitride layer with hydrogen, oxygen and nitrous oxide gases as recited in independent claims 1 and 40.

If the Examiner is to maintain the rejection, Applicants' respectfully request the Examiner to explicitly point out the language in Shue that teaches or is being construed as teaching the formation of a structure having an oxidation layer over a dielectric or silicon nitride layer as asserted in the Office Action. As discussed above, a careful reading of Shue by Applicants has not revealed any such teaching. Also, if the rejection is to be maintained, the Examiner is specifically requested to address the failure of Shue and Ma to disclose the specific combination of gases used for oxidizing a dielectric or silicon nitride layer, as discussed above and claimed in the present application. This shortcoming of the rejection was presented in Applicants' response to

Office Action filed on May 12, 2003, but was not addressed in the Office Action dated July 29, 2003.

Absent evidence in the prior art which refutes the analyses presented above, Applicants submit that the claims in this application have been conclusively demonstrated to be patentably distinguishable over the prior art of record. As each of the presently pending claims is therefore believed to be in immediate condition for allowance, the Examiner is respectfully requested to favorably reconsider and pass this application to issue.

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Respectfully submitted,

By 

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